What is claimed is:

1. A corneal appliance, comprising:

a lens body having an anterior surface, a posterior surface, and a peripheral edge at a juncture of the anterior and posterior surfaces, and being structured to be placed on a deepithelialized cornea of an eye of a patient; and

epithelial cells fixedly positioned over the anterior surface of the lens body before the body is placed on a deepithelialized cornea of an eye of the patient, the epithelial cells are derived from cultured stem cells.

2. The corneal appliance of claim 1, wherein the epithelial cells are derived from cultured stem cells obtained from the patient.

3. The corneal appliance of claim 1, wherein the cultured stem cells are obtained from embryonic or fetal tissue.

4. The corneal appliance of claim 1, wherein the lens body is structured to improve the vision of the patient.

5. The corneal appliance of claim 1, wherein the lens body comprises an optic zone and a peripheral zone, the optic zone being bounded by the peripheral zone.

6. The corneal appliance of claim 1, wherein the epithelial cells extend over the anterior surface to the peripheral edge of the lens body.

7. The corneal appliance of claim 1, wherein the epithelial cells extend over the anterior surface of the lens and beyond the peripheral edge of the lens body.

8. The corneal appliance of claim 1, wherein the cultured stem cells are limbal stem cells.

9. The corneal appliance of claim 1, wherein the epithelial cells are grown *in vitro* on the anterior surface of the lens body.

10. The corneal appliance of claim 1, wherein the epithelial cells are grown *in vitro* and are applied as a layer of cells to the anterior surface of the lens body.

11. The corneal appliance of claim 1, further comprising a cellular attachment element disposed between the anterior surface of the lens body and the epithelial cells.

12. The corneal appliance of claim 11, wherein the cellular attachment element comprises a plurality of indentations in the anterior surface of the lens body that facilitate cellular attachment of the epithelial cells to the lens body.

13. The corneal appliance of claim 12, wherein at least one of the plurality of indentations comprises a hole extending through the lens body from the anterior surface to the posterior surface.

14. The corneal appliance of claim 11, wherein the cellular attachment element comprises a polymer that supports adhesion of the epithelial cells to the lens body.

15. The corneal appliance of claim 11, wherein the cellular attachment element comprises a corneal enhancer moiety.

16. The corneal appliance of claim 15, wherein the corneal enhancer moiety specifically binds to an additional moiety present on the extracellular surface of an epithelial cell so that the additional moiety sufficiently binds to the corneal enhancer moiety to prevent the epithelial cells from being dislodged from the surface of the lens body.

17. The corneal appliance of claim 15, wherein the corneal enhancer moiety comprises an extracellular matrix protein.

18. The corneal appliance of claim 1, wherein the epithelial cells are provided in a layer including a fibrin matrix.

19. The corneal appliance of claim 1, wherein the corneal appliance is a corneal onlay.

20. The corneal appliance of claim 1, wherein substantially all of the cornea is deepithelialized.

21. The corneal appliance of claim 1, wherein the lens body comprises collagen.

22. The corneal appliance of claim 21, wherein the collagen is obtained from an animal.

23. The corneal appliance of claim 21, wherein the collagen is recombinantly produced.

24. The corneal appliance of claim 1, wherein the lens body is a stroma-like structure.

25. The corneal appliance of claim 24, wherein the lens body is a stroma-like structure grown *in vitro*.

26. The corneal appliance of claim 1, wherein the lens body is a hydrogel.

27. The corneal appliance of claim 1, wherein the lens body comprises a non-hydrogel material.

28. A corneal appliance manufactured by a process comprising steps of:

culturing stem cells until at least a fraction of the stem cells have differentiated into corneal epithelial cells; and

applying a plurality of cells obtained from the stem cell culture on an anterior surface of a lens body to form a layer of epithelial cells that are

fixedly secured on the anterior surface of the lens body before the lens body is placed on the eye.

29. The corneal appliance of claim 28, wherein the cultured stem cells are obtained from a patient receiving the corneal appliance.

30. The corneal appliance of claim 28, wherein the cultured stem cells are obtained from fetal or embryonic tissue.

31. The corneal appliance of claim 28, wherein the cells that are applied to the anterior surface of the lens body are limbal stem cells.

32. The corneal appliance of claim 28, wherein the plurality of cells applied to the anterior surface of the lens are epithelial cells defining a layer of cells.

33. The corneal appliance of claim 28, wherein the process further comprises a step of:

culturing the plurality of cells on the anterior surface of the lens body to form a layer of cells that extends over the anterior lens surface.

34. The corneal appliance of claim 28, wherein the process further comprises a step of:

providing a cellular attachment element on the anterior surface of the lens body to facilitate attachment of the plurality of cells to the surface of the lens body.

35. The corneal appliance of claim 28, wherein the lens body comprises collagen.

36. The corneal appliance of claim 28, wherein the lens body comprises a synthetic stroma.

37. A corneal appliance, comprising:

a lens body shaped to have a desired optical power to accommodate for a visual deficiency of an eye of a subject; and

epithelial cells secured over an anterior surface of the lens body before the lens body is placed in the eye, and derived from cultured stem cells.

38. The corneal appliance of claim 37, wherein the cultured stem cells are corneal limbal stem cells obtained from the subject receiving the corneal appliance.

39. The corneal appliance of claim 37, wherein the cultured stem cells are obtained from embryonic or fetal tissue.

40. The corneal appliance of claim 37, wherein the lens body comprises collagen.

41. The corneal appliance of claim 37, wherein the lens body is a synthetic stroma.

42. The corneal appliance of claim 37, further comprising a cellular attachment element disposed on an anterior surface of the lens body.

43. The corneal appliance of claim 37, wherein the appliance is structured to improve myopia in the subject.

44. The corneal appliance of claim 37, wherein the appliance is structured to improve hyperopia in the subject.

45. The corneal appliance of claim 37, wherein the appliance is structured to improve presbyopia in the subject.

46. The corneal appliance of claim 37, wherein the appliance is structured to improve astigmatism in the subject.

47. A method of producing a corneal appliance, comprising the steps of:

culturing stem cells until at least a fraction of the stem cells have differentiated into corneal epithelial cells; and

applying the cultured cells over a lens to form a layer of corneal epithelium.

48. The method of claim 47, wherein the stem cells are corneal limbal stem cells.

49. The method of claim 47, wherein the stem cells are stem cells obtained from embryonic or fetal tissue.

50. The method of claim 47, wherein the stem cells are cultured until they form a layer of epithelial cells that can be applied over the lens body.

51. The method of claim 47, wherein the stem cells are cultured in a fibrin matrix gel.

52. The method of claim 47, further comprising a step of applying a cellular attachment element to the lens body to facilitate attachment between the cultured cells and the lens body.

53. The method of claim 47, comprising a step of forming the lens body from collagen in a mold to create a synthetic stroma-like structure having specific optical properties.

54. The method of claim 47, wherein the lens body is a hydrogel, and is structured to facilitate attachment of the cells to the lens body.

55. A corneal appliance, comprising:

a lens body comprising a synthetic lens material and dimensioned to be placed over a deepithelialized cornea of an eye of a subject; and

a preformed layer of epithelial cells obtained from the subject receiving the corneal appliance, the preformed layer being disposed over an anterior surface of the lens body.

56. The corneal appliance of claim 55, wherein the lens body is configured to correct a refractive

error selected from the group consisting of myopia, hyperopia, astigmatism, and presbyopia.

57. The corneal appliance of claim 55, wherein the lens body is configured to correct a wavefront aberration of an eye of a patient.

58. The corneal appliance of claim 55, wherein the lens body includes at least one of a multifocal zone, a toric zone, and two or more zones joined without a junction.

59. The corneal appliance of claim 55, wherein the lens body comprises recombinant collagen.

60. The corneal appliance of claim 55, wherein the lens body comprises a synthetic polymeric material.

61. The corneal appliance of claim 55, wherein the lens body comprises a combination of a synthetic material and collagen.

62. The corneal appliance of claim 61, wherein the collagen is selected from a group consisting of bovine collagen, porcine collagen, avian collagen, murine collagen, and equine collagen.

63. The corneal appliance of claim 61, wherein the collagen is recombinant collagen.

64. The corneal appliance of claim 55, wherein the anterior surface of the lens body is treated to

promote attachment of the preformed layer of epithelial cells.

65. The corneal appliance of claim 55, wherein the preformed layer of epithelial cells is a layer of epithelium removed from the patient's eye.

66. The corneal appliance of claim 55, further comprising stem cells disposed over the anterior surface of the lens body that promote attachment of the preformed layer of epithelial cells to the lens body.

67. The corneal appliance of claim 55, wherein the preformed layer of epithelial cells is a layer of epithelium that remains attached to the epithelium of the patient's eye when the lens body is being placed over the cornea.

68. The corneal appliance of claim 55, wherein the preformed layer of epithelial cells has a temperature less than the temperature of the epithelial cells that are on the eye before the preformed layer of epithelial cells is placed over the lens body.

69. The corneal appliance of claim 55, wherein the preformed layer of epithelial cells is more securely attached to the anterior surface of the lens body than a layer of epithelium attached to a lens body obtained from donor corneal tissue.

70. A method of manufacturing a corneal appliance, comprising:

a) forming a synthetic material into a shape of a lens having a desired optical power; and

b) applying epithelial cells over an anterior surface of the lens so that the epithelial cells will attach to the lens.

71. The method of claim 70, wherein the lens comprises collagen.

72. The method of claim 71, wherein the collagen is a recombinant collagen.

73. The method of claim 71, wherein the lens comprises a combination of a synthetic material and collagen.

74. The method of claim 70, further comprising a step of:

modifying the surface of the lens before applying the epithelial cells to promote attachment of the epithelial cells to the lens.

75. The method of claim 70, further comprising a step of:

adding stromal keratocytes to the lens.

76. The method of claim 70, further comprising a step of:

culturing stem cells on the first surface of the lens so that the stem cells differentiate into corneal epithelial cells.

77. The method of claim 70, wherein the epithelial cells are provided in a preformed layer obtained from a patient receiving the corneal appliance.

78. The method of claim 77, wherein the preformed layer of epithelial cells is formed by separating a portion of the patient's corneal epithelium from the Bowman's membrane of the eye to create a flap of epithelium that remains attached to the eye.

79. The method of claim 70, further comprising a step of applying an adhesive to facilitate securing the corneal appliance over an eye of the subject.

80. The method of claim 70, wherein the synthetic material is shaped to have a center thickness between about 10 micrometers to about 300 micrometers, and an edge thickness between about 0 micrometers to about 120 micrometers.

81. A method for vision correction, comprising:

inserting a vision correcting ocular device beneath an epithelium of a cornea of an eye substantially without uncovering an anterior surface of the cornea located under the epithelium.

82. The method of claim 81, further comprising forming an incision in the epithelium, and inserting the ocular device through the incision.

83. The method of claim 82, wherein the step of forming an incision includes forming an incision on an approximate nasal portion, a temporal portion, superior portion, and/or inferior portion of the epithelium.

84. The method of claim 82, wherein the step of forming an incision includes forming an incision on an approximate medial portion of the epithelium to form a first pocket and a second pocket, each pocket sized to accommodate a portion of the lens body.

85. The method of claim 81, further comprising deforming the ocular device prior to the inserting step.

86. The method of claim 81, further comprising removing the ocular device from the eye, and inserting another vision correcting ocular device beneath the epithelium of the eye.

87. The method of claim 81, wherein the ocular device is a vision correcting lens.

88. The method of claim 81, wherein the ocular device is a contact lens structured to be placed between the epithelium and a Bowman's membrane of the cornea.

89. The method of claim 81, wherein the ocular device comprises a synthetic material.

90. The method of claim 81, wherein the ocular device comprises a synthetic polymeric material.

91. The method of claim 81, wherein the inserting step occurs without forming an epithelial flap.

92. The method of claim 81, further comprising forming a plurality of incisions in the epithelium.

93. The method of claim 81, wherein the inserting step occurs substantially without damaging the surface of the cornea beneath the epithelium.

94. The method of claim 93, wherein the inserting step occurs substantially without damaging a Bowman's membrane of the cornea.

95. The method of claim 93, wherein the inserting step occurs substantially without damaging a portion of a stroma of the cornea of the eye.

96. The method of claim 81, further comprising administering a healing agent to the eye in an amount effective to promote healing of the epithelium.

97. The method of claim 81, wherein the inserting step comprises lifting a portion of the epithelium from the cornea, forming an incision in the epithelium, and passing the ocular device through the incision.

98. The method of claim 97, wherein the epithelium is lifted using a vacuum.

99. The method of claim 97, wherein the epithelium is lifted by delivering a fluid beneath the epithelium.

100. The method of claim 81, further comprising applying an effective amount of an epithelium preserving agent to the epithelium.

101. The method of claim 100, wherein the epithelium preserving agent includes a gel.

102. The method of claim 100 wherein the epithelium preserving agent comprises a component selected from the group consisting of water soluble polymeric materials, water swellable polymeric materials and mixtures thereof.

103. The method of claim 100, wherein the epithelium preserving agent includes at least one cellulosic component.

104. The method of claim 103, wherein the epithelium preserving agent includes hydroxymethylcellulose.

105. The method of claim 82, wherein forming step comprises using a sharp blade to slice through the epithelium.

106. The method of claim 82, wherein the forming step comprises using a blunt instrument to separate the epithelium substantially without slicing the epithelium.

107. The method of claim 82, wherein the forming step comprises using a microkeratome.

108. The method of claim 106, wherein the blunt instrument is a spatula or a wire.

109. A method for correcting vision, comprising:

raising a portion of an epithelium of a cornea of an eye away from a Bowman's membrane of the cornea;

cutting a portion of the epithelium to create an incision in the epithelium substantially without damaging the Bowman's membrane; and

inserting a corrective ocular device through the incision so that the ocular device is located between the epithelium and the Bowman's membrane.

110. The method of claim 109, wherein the step of raising a portion of the epithelium includes using a vacuum on the epithelium.

111. The method of claim 109, wherein the step of raising a portion of the epithelium includes applying a liquid beneath the epithelium.

112. The method of claim 111, wherein the liquid includes sodium chloride and/or other tonicity agent.

113. The method of claim 111, wherein the liquid is a hypertonic aqueous liquid.

114. The method of claim 109, wherein the step of cutting a portion of the epithelium includes using a microkeratome.

115. The method of claim 109, wherein the epithelium is cut without forming an epithelial flap.

116. The method of claim 109, wherein the inserting step occurs substantially without uncovering an anterior surface of the Bowman's membrane

117. The method of claim 109, further comprising applying an epithelial preserving agent to the epithelium.

118. The method of claim 109, further comprising removing the ocular device from beneath the epithelium, and inserting another corrective ocular device beneath the epithelium.

119. The method of claim 109, wherein the corrective ocular device is a vision correcting lens.

120. The method of claim 109, further comprising maintaining a stroma of the cornea substantially intact or undamaged.

121. A method of correcting vision, comprising:

applying a liquid to the epithelium of a cornea of an eye, the liquid being effective in

loosening the epithelium substantially without killing epithelial cells;

treating the epithelium to provide and/or maintain the epithelium in a moisturized state;

raising a portion of the loosened, moisturized epithelium from a surface of a cornea of an eye located below the epithelium;

separating the raised portion of the epithelium from the surface of the cornea;

forming one or more incisions in the raised portion of the epithelium; and

inserting a corrective ocular device beneath the epithelium through the one or more incisions.

122. The method of claim 121, wherein the steps occur sequentially.

123. The method of claim 121, further comprising, prior to the forming step, delivering a substance beneath the raised portion of the epithelium to maintain a spaced apart relationship between the epithelium and the surface of the cornea.

124. The method of claim 121, wherein the liquid that is applied includes sodium chloride and/or other tonicity agent.

125. The method of claim 121 wherein the liquid that is applied is a hypertonic aqueous liquid.

126. The method of claim 121, further comprising scoring a portion of the epithelium to create an epithelial defect prior to applying the liquid.

127. The method of claim 121, wherein the treating step comprises applying a gel to the epithelium.

128. The method of claim 127, wherein the gel-containing composition comprises a component selected from the group consisting of water soluble polymeric materials, water swellable polymeric materials and mixtures thereof.

129. The method of claim 127, wherein the gel-containing composition comprises at least one cellulosic component.

130. The method of claim 129 wherein the gel-containing composition comprises hydroxymethylcellulose.

131. The method of claim 121, wherein the step of raising a portion of the epithelium includes using a vacuum.

132. The method of claim 121, wherein the step of separating the epithelium from the surface of the cornea includes using a blunt dissection apparatus.

133. The method of claim 132, wherein the blunt dissection apparatus comprises a spatula.

134. The method of claim 121, wherein the substance that is delivered to beneath the raised

portion of the epithelium is a gel-containing composition.

135. The method of claim 134, wherein the gel-containing composition comprises a component selected from the group consisting of water soluble polymeric materials, water swellable polymeric materials and mixtures thereof.

136. The method of claim 134, wherein the gel-containing composition comprises a cellulosic component

137. The method of claim 134, wherein the gel-containing composition includes hydroxymethylcellulose.

138. The method of claim 121, wherein the one or more incisions are formed using a microkeratome.

139. The method of claim 121, wherein the forming step produces one or more epithelial flaps.

140. The method of claim 121, wherein the forming step comprises forming a plurality of incisions in the raised portion of the epithelium.

141. The method of claim 140 wherein the forming step produces two or more epithelial flaps.

142. The method of claim 121, wherein the ocular device is a vision correcting lens.

143. The method of claim 142, wherein the ocular device is a contact lens.

144. The method of claim 121, further comprising applying a healing agent to the epithelium at the one or more incision.

145. A method of reversible vision correction, comprising

inserting a corrective ocular device beneath an epithelium of a cornea of an eye substantially without damaging a Bowman's membrane of the cornea; and

removing the corrective ocular device from the eye.

146. The method of claim 145, further comprising inserting another corrective ocular device beneath the epithelium of the cornea.

147. The method of claim 146, wherein each of the ocular devices is a vision correcting lens.

148. The method of claim 145, wherein the ocular device is inserted beneath the epithelium without forming an epithelial flap.

149. The method of claim 145, further comprising forming a flap of epithelial tissue, and inserting the ocular device beneath the epithelial flap.

150. The method of claim 145, further comprising administering a moisturizer to the epithelium

effective in providing and/or maintaining the epithelium in a moisturized state.

151. The method of claim 150, wherein the moisturizer is a gel-containing composition.

152. The method of claim 151, wherein the gel-containing composition comprises a component selected from the group consisting of water soluble polymeric materials, water swellable polymeric materials and mixtures thereof.

153. The method of claim 151 wherein the gel-containing composition comprises at least one cellulosic component.

154. The method of claim 153 wherein the gel-containing composition includes hydroxymethylcellulose.

155. The method of claim 145, wherein the ocular device is inserted beneath the epithelium through an incision in the epithelium formed by a microkeratome.

156. The method of claim 146, wherein the other ocular device is inserted beneath the epithelium through an incision formed by a microkeratome.

157. The method of claim 145, further comprising raising a portion of the epithelium and forming an incision in the epithelium substantially without damaging a Bowman's membrane of the cornea.

158. The method of claim 145, further comprising separating a portion of the epithelium from a Bowman's membrane of the cornea using blunt dissection.

159. The method of claim 145, wherein the ocular device is removed from the eye after a sufficient amount of time to test the vision correction provided by the ocular device.

160. A method of correcting vision, comprising:

applying a liquid to the epithelium of a cornea of an eye, the liquid being effective in loosening the epithelium substantially without killing epithelial cells;

raising a portion of the loosened epithelium from a surface of a cornea of an eye located below the epithelium;

separating the raised portion of the epithelium from the surface of the cornea;

delivering a substance beneath the raised portion of the epithelium to maintain a spaced apart relationship between the epithelium and the surface of the cornea;

forming one or more elongated incisions in the raised portion of the epithelium; and

inserting a corrective ocular device beneath the epithelium through the one or more incisions.

161. The method of claim 160, wherein the liquid that is applied includes sodium chloride and/or other tonicity agent.

162. The method of claim 160, wherein the liquid that is applied is a hypertonic aqueous liquid.

163. The method of claim 160, further comprising scoring a portion of the epithelium to create an epithelial defect prior to applying the liquid.

164. The method of claim 160, wherein the step of raising a portion of the epithelium includes using a vacuum.

165. The method of claim 160, wherein the step of separating the epithelium from the surface of the cornea includes using a blunt dissection apparatus.

166. The method of claim 165, wherein the blunt dissection apparatus comprises a spatula.

167. The method of claim 160, wherein the substance that is delivered to beneath the raised portion of the epithelium is a gel-containing composition.

168. The method of claim 167, wherein the gel-containing composition comprises a component selected from the group consisting of water soluble polymeric materials, water swellable polymeric materials and mixtures thereof.

169. The method of claim 167, wherein the gel-containing composition comprises at least one cellulosic component.

170. The method of claim 169, wherein the gel-containing composition includes hydroxymethylcellulose.

171. The method of claim 160, wherein the one or more incisions are formed using a microkeratome.

172. The method of claim 160, wherein the forming step produces one or more epithelial flaps.

173. The method of claim 160, wherein the forming step comprises forming a plurality of incisions in the raised portion of the epithelium.

174. The method of claim 173 wherein the forming step produces two or more epithelial flaps.

175. The method of claim 160, wherein the ocular device is a vision correcting lens.

176. The method of claim 175, wherein the ocular device is a contact lens.

177. The method of claim 160, further comprising applying a healing agent to the epithelium at the one or more incisions.